

### SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 10 is found on page 8, lines 19-29 of the specification. No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment, claims 10-13, 15, 16, 18 and 20 will remain active in this application.

### REQUEST FOR RECONSIDERATION

The claimed invention is directed to a process for producing at least one alkoxylate.

Alkoxylate preparation by reaction of a starter molecule with an alkylene oxide in the presence of a double metal cyanide compound has been reported in the literature (page 1, lines 16-21 of the specification). However, issues as to catalyst stability and induction time remain such that improved methods are sought.

The claimed invention addresses this problem by providing a method for preparing at least one alkoxylate by contacting at least one alkylene oxide with a **Guerbet alcohol** in the presence of at least one double metal cyanide compound having an organic additive, at a **temperature of from 140-155 °C**. Applicants have discovered that such a temperature range provides for good induction times and good catalyst stability in the reaction of a Guerbet alcohol. Such a method is nowhere disclosed or suggested in the cited prior art of record.

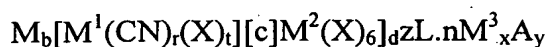
The rejection of claims 10, 14, 15, and 18 under 35 U.S.C. § 103(a) over Clement et al. (U.S. 6,429,324) in view of Kosmin (U.S. 2,508,036) is respectfully traversed.

The examiner has relied upon Clement et al. as teaching a process of ethoxylation of an initiator compound in the presence of a double metal cyanide catalyst wherein the reaction temperature is described as from 25°C to up to 150 °C or more, preferably 50-130 °C and more preferably about 70-120 °C (column 3, lines 54-59). The examiner cites to column 2, lines 58-67 for a disclosure that the "induction period" may range from a few minutes to

several hours depending on the particular catalyst and the temperature used. There is no disclosure of a double metal cyanide compound having an organic additive or the effect of temperature on both the induction time and catalyst stability.

*Clement Et Al. Fails To Disclose The Claimed Double Metal Cyanide Compound*

Clement et al. describes a metal-containing cyanide catalyst



Where L is a "organic complexing agent" and  $M^3_xA_y$  is a water-soluble salt of metal ion  $M^3$  and anion A. (column 6, lines 1-26) Suitable organic complexing agents are described as alcohols, aldehydes, ketones, ethers, amides, nitriles, sulfides, and the like (column 6, lines 56-62). There is no disclosure of an organic additive which is at least one of polyethers, polyesters, polycarbonates, polyalkylene glycol sorbitan esters, polyalkylene glycol glycidyl ethers, polyacrylamide, poly(acrylamide-co-acrylic acid), polyacrylic acid, poly(acrylamide-co-maleic acid), polyacrylonitrile, polyalkyl acrylates, polyalkyl methacrylates, polyvinyl methyl ether, polyvinyl ethyl ether, polyvinyl acetate, polyvinyl alcohol, poly-N-vinylpyrrolidone, poly(N-vinylpyrrolidone-co-acrylic acid), polyvinyl methyl ketone, poly(4-vinylphenol), poly(acrylic acid-co-styrene), oxazoline polymers, polyalkylenimines, maleic acid and maleic anhydride copolymers, hydroxyethylcellulose, polyacetates, ionic surface- and interface-active compounds, bile acids or their salts, esters or amides, carboxylic esters of polyhydric alcohols, glycosides and mixtures thereof.

In contrast, the claimed invention is directed to a process in which a double metal cyanide compound is used having an organic additive P which is at least one of polyethers, polyesters, polycarbonates, polyalkylene glycol sorbitan esters, polyalkylene glycol glycidyl ethers, polyacrylamide, poly(acrylamide-co-acrylic acid), polyacrylic acid, poly(acrylamide-co-maleic acid), polyacrylonitrile, polyalkyl acrylates, polyalkyl methacrylates, polyvinyl

methyl ether, polyvinyl ethyl ether, polyvinyl acetate, polyvinyl alcohol, poly-N-vinylpyrrolidone, poly(N-vinylpyrrolidone-co-acrylic acid), polyvinyl methyl ketone, poly(4-vinylphenol), poly(acrylic acid-co-styrene), oxazoline polymers, polyalkylenimines, maleic acid and maleic anhydride copolymers, hydroxyethylcellulose, polyacetates, ionic surface- and interface-active compounds, bile acids or their salts, esters or amides, carboxylic esters of polyhydric alcohols, glycosides and mixtures thereof. Applicants note that the claims have been amended to recite the presence of specific organic additives. As the cited reference fails to disclose the claimed double metal cyanide compound, the claimed invention is not rendered obvious from the cited reference.

*No Suggestion To React Guerbet Alcohol In The Clement Et Al Process*

The cited combination of references provides no motivation to use Guerbet alcohol in the process of Clement et al.

Clement et al. describes the initiator compound as follows:

The initiator compound is a material having at least one oxyalkylatable group. By oxyalkylatable group, it is meant a heteroatom-containing group that can react with ethylene oxide in a ring-opening reaction to form a covalent bond between the heteroatom and a carbon atom of the ethylene oxide. The heteroatom is preferably oxygen or sulfur and is usually attached to a hydrogen atom. Thus, suitable heteroatom-containing groups include hydroxyl, carboxylic acid and thiol groups. Preferred initiator compounds have a molecular weight of about 1000 or less. (column 4, lines 56-65)

However, the oxyalkylatability of the initiator compound is in the context of a DMC-catalyst as this is the reaction which occurs. There is no suggestion that Guerbet alcohol would be such an initiator.

While Kosmin has been cited for the reaction of a Guerbet alcohol with ethylene oxide, such reaction is catalyzed with a strong alkali of KOH. Thus, there is no suggestion by Kosmin that a Guerbet alcohol would be an initiator compound as suggested by Clement et al.

Thus, those of skill in the art would not be motivated to use a Gurbet alcohol in the process of Clement et al. and therefore the claimed invention is not made obvious from this combination of references.

*There Is No Suggestion Of The Claimed Temperature Range Of 140-155°C*

Clement et al fails to suggest the narrow reaction temperature range of 140-155 °C.

At column 3, lines 54-59 the reference describes a reaction temperature of 25°C or even lower as well as temperatures of up to 150°C or greater, **preferably** 50-130°C, and **more preferably** about 70-120°C. Such a broad disclosure, coupled with a greatest preference for a range of 70-120°C does not make obvious the claimed range of 140-155°C as the claimed range is significantly greater than the most preferred range. To the contrary, if one were to have followed the disclosure of Clement et al. using his most preferred temperature range of 70 to about 120°C, one not have observed any reaction at all for Gurbet alcohol as applicants have demonstrated that no reaction occurred at a temperature of 100°C and that induction time of 20 minutes was necessary at the preferred temperature of 120°C.

As the claimed range is outside the most preferred temperature range of 70 to about 120°C and that poor results are observed within the most preferred temperature range, the claimed range of 140-155°C would not have been obvious.

*Applicants Observe An Unexpected Drop In Induction Time Without Loosing Catalyst Activity for a temperature range of 140-155°C*

Applicants have discovered that a temperature range of **from 140-155 °C** in the reaction of a Guerbet alcohol to be a temperature which exhibits short induction times without adversely effecting catalyst stability.

For the temperature range of 140-155 °C in the reaction of a Guerbet alcohol reacted with ethylene oxide with a double metal cyanide catalyst, the induction times were measured at 100 °C, 120 °C, 140 °C and 160 °C.

<i>Temperature</i>	<i>Induction time</i>
100°C	Did not start
120°C	20 min
140°C	5 min
160°C	5 min

At a temperature of 100 °C, the reaction did not start, while at 120 °C, the reaction exhibited a 20 minute induction time. In contrast, at a temperature of 140 °C, within the claimed range, the induction time was reduced to only 5 minutes. Applicants further note, that at 160 °C, the induction time was also 5 minutes.

Comparative Examples 2 and 3 illustrate reaction and induction at 160 °C wherein the addition of ethylene oxide was stopped because reaction could not longer be detected. This is evidence of reduced catalyst stability. In Comparative Example 2, 8 mols of ethylene oxide were desired to be added however only about 81% was added before reaction could no longer be detected. In Comparative Example 3, after addition of 1.2 mols of propylene oxide, a desired 6 mols of ethylene oxide was prematurely terminated after about 84% addition.

In contrast, Examples 1 and 2, conducted at 140 °C went to completion. Thus, applicants have discovered and demonstrated a temperature range which gives both a rapid induction time and high catalyst stability, properties which are not observed throughout the broad range of 25 – 150 °C or more, as disclosed by Clement et al. Clement et al. makes no disclosure of any relationship between the reaction temperature and catalyst stability and accordingly applicants' discovery of a temperature range of 140-155 °C which has both good induction time and catalyst stability is an improved result relative to the disclosure of Clement et al.

The examiner asserts that a reduced induction time would have been expected based on the disclosure of Clement et al of

In most cases, a so-called "induction period" occurs at the beginning of the polymerization reaction, in which little or no polymerization occurs. Under ethylene oxide polymerization conditions, this is manifested by a period during which reactor pressure remains constant or decreases only slowly. The induction period may range from a few minutes to several hours, depending on the particular catalyst that is used and the temperature. During this induction period, the catalyst becomes activated and then rapid polymerization of the ethylene oxide commences. Column 2, lines 58-67

However, the fact that the induction time is significantly better at a temperature which is outside of the most preferred temperature range of 70 to about 120°C is not suggested by the cited references. To the contrary the improved induction time outside of the preferred range of 70 to about 120°C is most unexpected as otherwise the range of 70 to about 120°C would not have been most preferred.

Further, the examiner provides not description of any expectation with respect to catalyst stability beyond 155°C, such that applicants' discovery of reduced catalyst stability beyond 155°C is not suggested by the cited reference.

Kosmin is merely cited to disclose the reaction of a Guerbet alcohol but fails to disclose or suggest the use of a double metal cyanide catalyst or the temperature range of 140-155 °C providing for reduced induction time and high catalyst stability. As the cited references fail to disclose or suggest the results obtained for this temperature range, the claimed invention is not obvious from these references and accordingly withdrawal of the rejections under 35 U.S.C. § 103(a) is respectfully requested.

The rejection of claims 10-13, 15, 16, 18 and 20 on the grounds of nonstatutory obviousness-type double patenting over claims 1, 3-4 and 8-18 of U.S. 7,196,030 is obviated by the enclosed terminal disclaimer disclaiming the terminal portion of any patent issuing from the above-identified application which would extend beyond the full statutory term of

Application No. 10/527,529  
Reply to Office Action of April 23, 2007

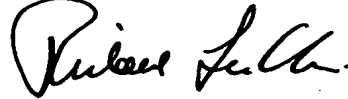
U.S. 7,196,030. In view of applicants' disclaimer, withdrawal of this ground of rejection is respectfully requested.

Applicants submit this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

Norman F. Oblon



---

Richard L. Chinn, Ph.D.

Attorney of Record

Registration No. 34,305

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 03/06)

NFO/RLC/law

<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>	
Phone:	(703) 413-3000
Email:	sgreen@oblon.com
Correspondent Name:	Oblon, Spivak, et al.
Address Line 1:	1940 Duke Street
Address Line 4:	Alexandria, VIRGINIA 22314
<b>ATTORNEY DOCKET NUMBER:</b>	267332US
<b>NAME OF SUBMITTER:</b>	Sheila Green
<b>Signature:</b>	/Sheila Green/
<b>Date:</b>	07/20/2007
<b>Total Attachments: 2</b> source=267332USAssignment#page1.tif source=267332USAssignment#page2.tif	
<b>RECEIPT INFORMATION</b>	
EPAS ID:	PAT327715
Receipt Date:	07/20/2007
Fee Amount:	\$40

**[Return to home page](#)**  
**[Start another assignment from the same template](#)**

[| .HOME](#) | [INDEX](#) | [SEARCH](#) | [eBUSINESS](#) | [CONTACT US](#) | [PRIVACY STATEMENT](#)



## Assignment of Application

0000053927

WHEREAS, I (WE)

*Christian Wulff, Alfred-Delp-Strasse 7, 68163 Mannheim , Germany*  
*Citizen of Germany*

*Michael Stößer, Ulmenweg 9, 67141 Neuhausen , Germany*  
*Citizen of Germany*

*Georg Heinrich Grosch, Im Nonnengarten 60, 67098 Bad Dürkheim , Germany*  
*Citizen of Germany*

*Kai-Uwe Baldenius, Sperlinggasse 1, 67063 Ludwigshafen , Germany*  
*Citizen of Germany*

*Edward Bohres, Q1 19, 68161 Mannheim , Germany*  
*Citizen of Germany*

respectively, have invented certain new and useful improvements in

Preparation of alkanol alkoxylates at optimized reaction temperatures  
for which an application for Letters Patent was executed on

(Application No. 10/527,529 , filed 3/11/2005 ), and

WHEREAS, *BASF Aktiengesellschaft* (hereinafter referred to as "ASSIGNEE"), having a place of business at 67056 Ludwigshafen, Germany, is desirous of acquiring the entire right, title and interest in and to said invention and in and to any Letters Patent that may be granted therefore in the United States and its territorial possessions and in any and all foreign countries;

NOW, THEREFORE, in consideration of the sum of Five Dollars (\$5.00), the receipt whereof is hereby acknowledged, and for other good and valuable consideration, I (WE), by these presents do sell, assign and transfer unto said ASSIGNEE, the full and exclusive right to the said invention in the United States and its territorial possessions and in all foreign countries and the entire right, title and interest in and to any and all Letters Patent which may be granted therefor in the United States and its territorial possessions and in any and all foreign countries and in and to any and all divisions, reissues, continuations, substitutions and renewals thereof.

I (WE) hereby authorize and request the Patent Office Officials in the United States and its territorial possessions and any and all foreign countries to issue any and all of said Letters Patent, when granted, to said ASSIGNEE as the assignee of my (our) entire right, title and interest in and to the same, for the sole use and behoof of said ASSIGNEE, its (his) successors and assigns, to the full end of the term for which said Letters Patent may be granted, as fully and entirely as the same would have been held by me (us) had this Assignment and sale not been made.

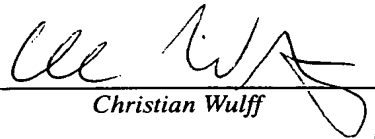
FURTHER, I (WE) agree that I (WE) will communicate to said ASSIGNEE, or its (his) representatives any facts known to me (us) respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuation, substitute, renewal and reissue applications, execute all necessary assignment papers to cause any and all of said Letter Patent to be issued to said ASSIGNEE, make all rightful oaths, and, generally do everything possible to aid said ASSIGNEE, its (his) successors and assigns, to obtain and enforce proper protection for said invention in the United States and its territorial possessions and in any and all foreign countries.

The undersigned hereby grant(s) the firm of **Oblon, Spivak, McClelland, Maier & Neustadt, P.C.**, 1940 Duke Street, Alexandria, Virginia 22314 the power to insert on this assignment any further identification, including the application number and filing date, which may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

0000053927

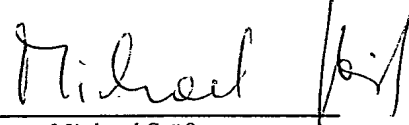
Date: December 15, 2004

Signature of Inventor:

  
Christian Wulff

Date: December 15, 2004

Signature of Inventor:

  
Michael Stöber

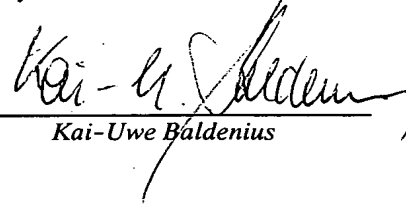
Date: December 15, 2004

Signature of Inventor:

  
Georg Heinrich Grosch

Date: December 15, 2004

Signature of Inventor:

  
Kai-Uwe Baldenius

Date: December 15, 2004

Signature of Inventor:

  
Edward Bohres